



New Dimensions in Simulator Technology



For a long time the airlines have been training their pilots on multi-million dollar simulators that duplicate the flight characteristics of the real aircraft, so that no "in flight" airborne training is required. The airline safety record per hour flown is 20 times better than that of general aviation, in spite of the fact that general aviation in the USA accounts for 80% of the total hours flown.

Now Aviation Simulation Technology has manufactured a General Aviation Flight simulator with the characteristics of the Airline units, at a price that puts it within the scope of every serious flight training establishment in the world.

Unlike the previous generation of procedure trainers, the single and multi-engine series simulators offered by AST have all the features of real flight. This means the greatest degree of training transfer and the broadest range of training capability. And this translates to the maximum return on training investment.



COMPUTER DRIVEN SIMULATION

The Aviation Simulation Technology's simulator combines the latest digital and microprocessor technology with painstaking attention to detail to produce a powerful easy-to-use teaching tool with positive transfer.

Actual Handling. Flight control effectiveness varies with airspeed—flight behind the power curve is possible—engine out performance is exactly as expected—stall speed is a function of angle of bank, power, and aircraft configuration—power available reduces with altitude—and pitch trim actually allows the elimination of elevator control forces. Even inverted flight with proper recovery can be demonstrated.

Instrumentation and Systems. All instruments have the proper interrelationship and characteristics—the electrical system, magnetos, gear, flaps, engine instrumentation, and fuel system are all fully functional—winds and turbulence can be selected digitally, and wind shear and changing winds left aloft can be selected. Individual instruments may be failed from a remote console, introducing partial panel at the most meaningful level.

Avionics. The simulator features the latest generation of King Silver Crown equipment, including the KNS-80 four waypoint area navigation system. A working audio panel and marker beacon receiver is also provided.

Navigation and Plotting. Perhaps the most remarkable feature of the simulator is the fact that it operates in "real world" locations, and can fly and plot on routes and approaches anywhere in the world. Simply insert in the front panel a computer memory module which contains the characteristics of an area including the location of airports, NAVAID, approaches, and terrain. The simulator is then ready to be flown and navigated exactly as an airplane. Standard modules are available for many areas, and custom modules can be provided from the factory. Navigational plotting can be carried out on any chart. Two digital settings are all that is required to set up a plot using a scale anywhere from 0.1 to 99.9 nautical miles to the inch.



1. Engine Gauges Fuel Contents. Fuel burn varies with power setting—tanks have to be managed to avoid engine failure. In flight refueling possible.

Oil—Temperature and pressure can be varied from the instructor console—oil temperature takes realistic time to warm up and cool down.

2. Landing Gear. Cycle time is realistic—drag varies with configuration. Gear can be failed from instructor console. Nose wheel steering on ground.

3. Airspeed Indicator. Stall speed varies with angle of bank, power setting and configuration; VMC correctly computed and aircraft will only climb "on one" at blue line speed.

4. Artificial Horizon. Correctly reflects attitude of aircraft—turbulence can be simulated in varying degrees of severity—aircraft lands and maneuvers on the ground. Can be failed in roll or pitch by instructor.

5. D.G. Has random precession.

6. Altimeter/VSI. Ground elevation is correctly computed from navigation program so aircraft lands and takes off at correct elevation. Turbulence can be simulated on both instruments.

7. Nav 1 and 2 Indicators. Actual King KI 208 & KI 209 indicators—operating in correct manner and sense—either can be failed by instructor.

8. ADF Indicator. Has rotatable compass card and can be failed by instructor.

9. Magnetic Compass. Accurately reproduces turn and acceleration errors.

AVIONICS

10. KT 78A. 4 digit transponder.

11. KY 196. 720 channel digital display com with stand-by frequency.

12. KNS 80. Combined 200 channel DME with ILS/VOR receiver and 4 way-point area Nav. Gives instantaneous DME miles, time and speed to VOR or way point—DME hold facility.

13. KMA 20. Audio panel/marker receiver—features automatic and correct ident of any station plus marker audio.

14. KN 53. No. 2 Nav with "stand-by" frequency.

15. ADF. With a digital display and "stand-by" frequency.

16. Throttle. Correctly simulates power setting for performance required. Aircraft can be taxed and "lined up" with asymmetric power.

17. Props. Vary RPM correctly and require synchronization—features engine noise and full feathering capability. Windmilling prop produces drag.

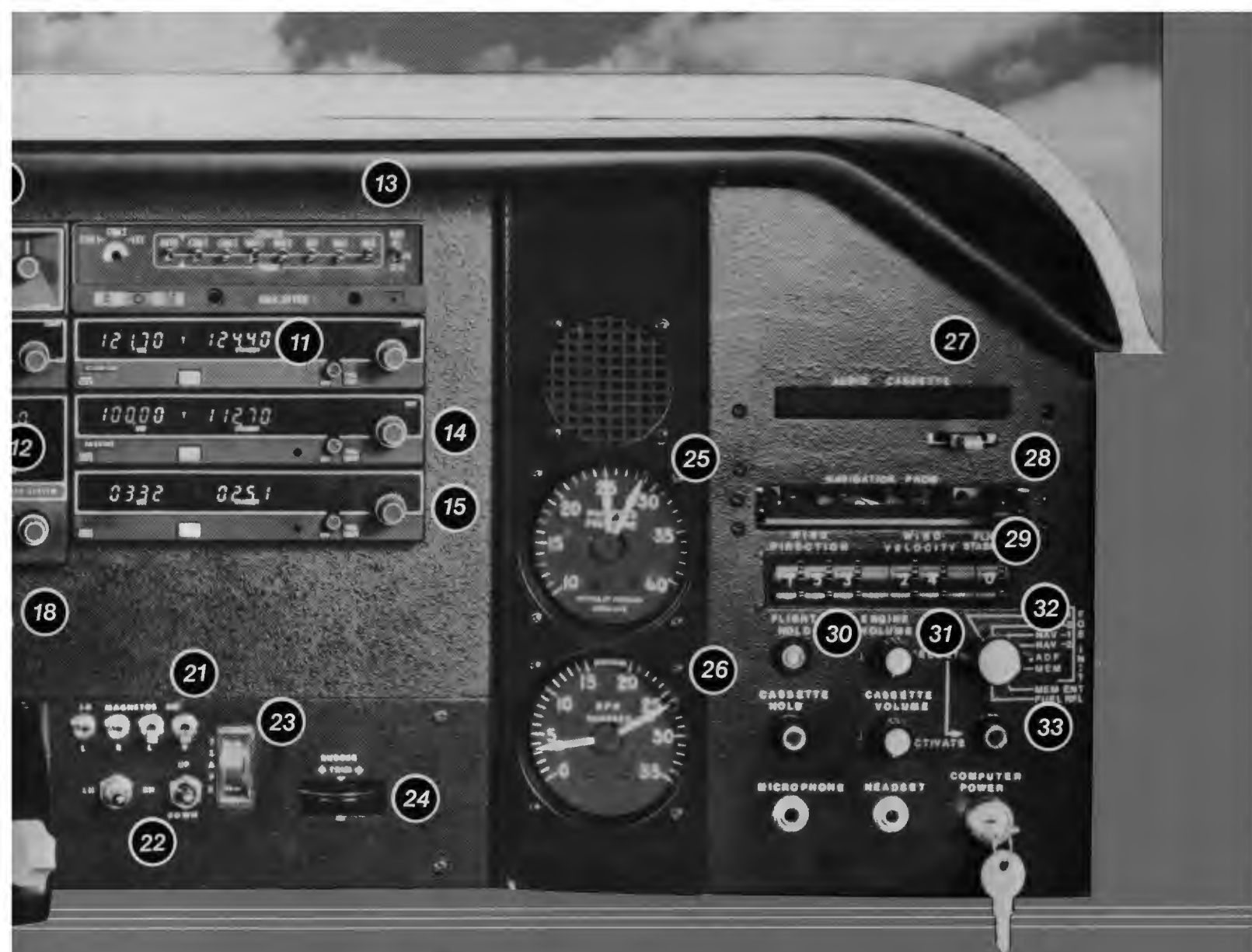
18. Mixtures. Mixtures govern engine fuel supply—engines cannot be started with mixture lean.

19. Fuel Selector. Requires pilot to exercise fuel management to avoid engine failure on long flights.

20. Park Brakes. Aircraft cannot accelerate for take-off with park brakes on, but can be "run up" against the brakes for realistic power checks.

21. Magnetos. Correctly simulate magneto performance—show "mag drop" on power check—engine will not start with mags off.

22. Starter. Engine will start only with master on, mixtures rich and mags on. In-flight restart capability.



23. Flaps. Stall speed varies with flap setting as does aircraft performance.

24. Rudder Trim. Correctly simulates rudder trim when airborne—relieves rudder pressure in asymmetric flight.

25. Manifold Pressure. Responds correctly to power settings and manifold pressure drop with increased altitude.

26. RPM Indicator. Correctly computes prop setting and power setting—magneto drop is simulated on one magneto.

27. Audio Cassette. Used in conjunction with "self briefing" courseware tapes for self instruction.

28. Navigation PROM. Plug in memory to inform simulator computer of NAVAID and airport data, anywhere in the world. PROMs can be built up as a worldwide library.

29. Wind Speed/Direction and Turbulence. Any wind from 0-99 kts in any direction 0-360 is computed. Turbulence in varying degrees of severity is simulated, as is wind shear and changing winds aloft.

30. Flight Hold. Freezes aircraft in any position to enable instructor or pilot to "hold" position for briefing or discussion. Flight is resumed upon disengagement.

31. Engine Noise. Each engine has its own computed sound to give engine noise and volume control. Props require synchronization.

32. Navigational Computer Console. Simulator can be instantly positioned to any VOR—NDB—ILS or tower equipped airport location or any waypoint simply by selecting the frequency and depressing the activate button.

33. Memory Feature. At any time during the flight the memory can be activated to store the exact position and altitude of the simulator at that point for future recall. This feature enables repeated approaches to be made from a given starting point and altitude.

The Digital design point and modular construction of our flight simulators permits new technology to be added as soon as it becomes available. Product enhancements can be retrofitted to older models, enabling customers to keep pace with state-of-the-art developments.



INTERACTIVE TRAINING SYSTEM (I*T*S)

The I*T*S couples a microcomputer to the simulator data bus. The computer stores altitude, position and performance data during a flight and manipulates this data for the purposes of analysis and evaluation. Air Traffic control voice communication as well as coaching, cueing and other logic based programs are provided.

VISUAL DISPLAY

The computer-generated visual display presents attitude and ground reference cues that are essential for maneuvers requiring outside reference. The selectable ceiling and visibility feature forces pilots to make the land/missed-approach decision themselves, and to transition from instrument to visual flight for the landing. Flight experience is psychologically reinforced, with a takeoff and landing included in each lesson.

HSI

The optional King Radio KI525A HSI replaces the standard heading indicator. Both CDI's remain installed, permitting switch selection of the HSI for display of NAV 1 information.



SINGLE ENGINE CONVERSION KIT

The single engine conversion kit permits an operator to reconfigure a multi-engine unit to a single. The interchange takes less than an hour, without soldering, special tools or recalibration.

PLOTTER

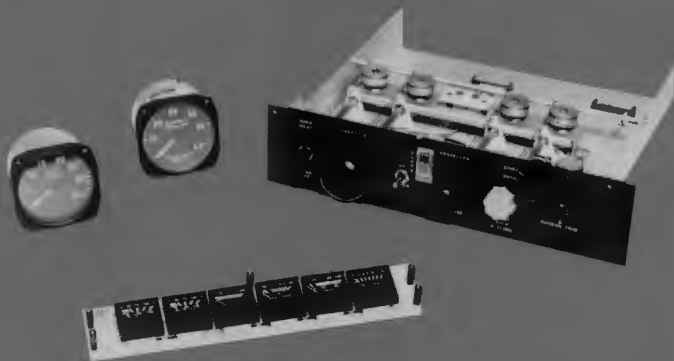
The unique X-Y plotter functions at any scale from 0.1 to 99.9 miles per inch, plotting from any center point. Tracking can be performed on actual charts, approach plates or blank paper for a detailed analysis of any maneuver, even a traffic pattern.

INSTRUCTOR CONSOLE

A multitude of failure modes may be created through individual or combined failures of instruments, engines and gauges. The unique gyro failure capability forces pilots to deal with the contradictory information presented when the attitude indicator fails, forcing a conscious decision to **ignore** the instrument horizon and utilize a partial panel scan.

RMI

The optional King Radio KI229 RMI replaces the standard ADF indicator. The dual needle instrument displays ADF bearing information on one needle; the other needle displays VOR bearing information from either NAV1 or NAV2. A basic ADF mode, locking the slaved card to the zero index, is also selectable.





HIGH TECHNOLOGY

Aviation Simulation Technology simulators are manufactured in Bedford, Massachusetts using an unprecedented level of digital and microprocessing technology in a unique design. Never before has such a level of computer sophistication been available to general aviation simulation, and the result is an extraordinary level of fidelity to actual flight. Additionally, the design point of this technology is open ended. Product additions and enhancements can be added to protect and expand the user's investment.

BUILT TO LAST

Each simulator receives exhaustive quality control testing to assure high reliability. Included in these procedures are 96 hours of high temperature "burn in" as well as shake table stressing to detect and correct potential component weakness. Quality assurance combined with effective field repair service assures maximum productivity.

FLIGHT COURSES

Courseware. Complete flight instruction curriculum including texts and tailored flight instruction cassette tapes.

Private
Commercial
Instrument
Multi-engine
Recurrency



Hanscom Field—East
Bedford, Massachusetts 01730
(617) 274-6600